

## X-Ray Storage Ring Parameters as of December 2002

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|  |  |   |                              |                                  |                                  |
|--|--|---|------------------------------|----------------------------------|----------------------------------|
| Normal Operating Energies                    | 2.800 GeV  |   |                              |                                  |                                  |
| Maximum Operating Current                    | 280 mA   |   |                              |                                  |                                  |
| Lifetime                                     | ~20 hours  |   |                              |                                  |                                  |
| Circumference                                | 170.1 meters   |   |                              |                                  |                                  |
| Number of Beam Ports on Dipoles              | 30   |   |                              |                                  |                                  |
| Number of Insertion Devices                  | 6  |   |                              |                                  |                                  |
| Maximum Length of Insertion Devices          | < 4.50 meters  |   |                              |                                  |                                  |
| $\lambda_c(E_c)$ at 1.36 T                   | 1.75 Å (7.1 keV)   |   |                              |                                  |                                  |
| $\lambda_c(E_c)$ at 5.0 T (W)                | 0.48 Å (26.1 keV)  |   |                              |                                  |                                  |
| B( $\rho$ )                                  | 1.36 Tesla (6.875 meters)  |   |                              |                                  |                                  |
| Electron Orbital Period                      | 567.2 nanoseconds  |   |                              |                                  |                                  |
| Damping Times                                | $\tau_x = \tau_y = 4$ msec; $\tau_z = 2$ msec  |   |                              |                                  |                                  |
| Lattice Structure (Chasman-Green)            | Separated Function, Quad Triplets  |   |                              |                                  |                                  |
| Number of Superperiods                       | 8  |   |                              |                                  |                                  |
| Magnet Complement                            | <table border="0" style="display: inline-table; vertical-align: middle;"> <tr> <td rowspan="3" style="font-size: 3em; vertical-align: middle;">}</td> <td>16 Bending (2.7 meters each)</td> </tr> <tr> <td>40 Quadrupole (0.45 meters each)</td> </tr> <tr> <td>16 Quadrupole (0.80 meters each)</td> </tr> </table> | } | 16 Bending (2.7 meters each) | 40 Quadrupole (0.45 meters each) | 16 Quadrupole (0.80 meters each) |
| }  | 16 Bending (2.7 meters each)   |   |                              |                                  |                                  |
|  | 40 Quadrupole (0.45 meters each)   |   |                              |                                  |                                  |
|  | 16 Quadrupole (0.80 meters each)   |   |                              |                                  |                                  |
| 32 Sextupole                                 | (0.20 meters each)   |   |                              |                                  |                                  |
| Nominal Tunes ( $\nu_x, \nu_y$ )             | 9.8, 5.7   |   |                              |                                  |                                  |
| Momentum Compaction                          | $4.10^{-3}$  |   |                              |                                  |                                  |
| RF Frequency                                 | 52.88 MHz  |   |                              |                                  |                                  |
| Radiated Power for Bending Magnets           | 198 kW (0.25A)   |   |                              |                                  |                                  |
| RF Peak Voltage                              | 1120 kV  |   |                              |                                  |                                  |
| Design RF Power                              | 450 kW   |   |                              |                                  |                                  |
| Synchrotron Tune ( $\nu_s$ )                 | 0.0023   |   |                              |                                  |                                  |
| Natural Energy Spread ( $\sigma_e/E$ )       | $9.2 \times 10^{-4}$   |   |                              |                                  |                                  |
| Natural Bunch Length ( $2\sigma$ )           | 8.7 cm   |   |                              |                                  |                                  |
| Number of RF Buckets                         | 30   |   |                              |                                  |                                  |
| Typical Bunch Mode                           | 25   |   |                              |                                  |                                  |
| Horizontal Damped Emittance ( $\epsilon_x$ ) | $7.5 \times 10^{-8}$ meter-rad   |   |                              |                                  |                                  |
| Vertical Damped Emittance ( $\epsilon_y$ )   | $1.5 \times 10^{-10}$ meter-rad  |   |                              |                                  |                                  |
| Power per Horizontal Milliradian (0.25A)     | 32W  |   |                              |                                  |                                  |

### Arc Source Parameters

|   |   |
|---|---|
| Betatron Function ( $\beta_x, \beta_y$ )          | 1.0 to 3.8 m, 7.9 to 26.5 m                                   |
| Dispersion Function ( $\eta_x, \eta'_x$ )         | 0.47 to -0.11, -0.39 to 0.22                                  |
| $\alpha_{x,y} = -\beta'_{x,y}/2$                  | -0.49 to 1.62, -3.4 to 4.5                                    |
| $\gamma_{x,y} = (1 + \alpha_{x,y}^2)/\beta_{x,y}$ | 0.952 to 0.962 m <sup>-1</sup> , 0.81 to 0.52 m <sup>-1</sup> |
| Source Size ( $\sigma_x, \sigma_y$ )              | 371 to 612 μm, 27 to 53 μm                                    |
| Source Divergence ( $\sigma'_x, \sigma'_y$ )      | 476 to 324 μrad, 9 to 7 μrad                                  |

### Insertion Device Parameters

|  |                   |
|--|-------------------|
| Betatron Function ( $\beta_x, \beta_y$ )     | 1.60 m, 0.35 m    |
| Source Size ( $\sigma_x, \sigma_y$ )         | 300 μm, 6 μm      |
| Source Divergence ( $\sigma'_x, \sigma'_y$ ) | 260 μrad, 35 μrad |